Avoiding Pitfalls in Urologic Diagnosis

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SUMMARY

Eight basic steps properly executed are necessary to correct diagnosis of urinary disorders: (1) History-taking, (2) general physical examination, (3) abdominal examination, (4) examination of external genitalia, (5) examination of the urine, (6) rectal examination and prostatic smear or vaginal examination, (7) tests of total renal function, (8) roentgenography as indicated.

If these procedures are carried out in this order, more information will be obtained and misleading findings will be avoided.

IF it were possible to analyze all diagnostic failures in urology, it would probably be found that an overwhelming majority are attributable to lack of adequate examination. "Adequate examination" does not refer to the technical steps such as cystoscopy and ureteral catheterization, but means taking full advantage of the simple steps of the urological examination (Table 1) which can be carried out by any general practitioner in his own office.

When eight basic steps are executed properly, an accurate diagnosis can be reached in over 90 per cent of cases in which patients consult a physician because of symptoms referable to disease of the urogenital tract. By adhering to this specific routine the physician will avoid omitting any of the vital steps and also avoid committing errors that arise when they are carried out in an improper sequence.

Step 1, the History: Nothing unusual is required in taking the history except that particular stress is placed on complaints referable to the urogenital tract. A physician should not be misled by a report of chills. Chilly sensations are common, almost universal; actual chills are unusual. An authentic shaking chill is of diagnostic importance if it is caused by urinary infection, because then it usually indicates an acute renal infection, sometimes acute prostatitis, but almost never cystitis.

Step 2, General Physical Examination: This includes examination of the head, neck, chest and the nervous system and precedes special attention to the urogenital organs. This part of the examination assumes greater importance if a patient is to be operated upon, when the condition of the cardiovascular system is a material factor, and in any effort to discover systemic evidence of tuberculosis, malignant growth and the like. A neurologic examination is especially required when the possibility of a ner-

vous disorder, such as neurogenic bladder disease, is encountered.

Step 3, the Abdominal Examination, includes special attention to the regions occupied by the kidneys, the ureters and the bladder.

One word of caution about renal palpation: Failure to elicit signs of tenderness does not rule out the possibility of infection in the kidney. Chronic renal infection often causes no physical symptoms, and even acute infections may produce no pain or tenderness, particularly in children. Even with a temperature of 104° or 105° F. caused by fulminating pyelonephritis, children frequently have no lumbar pain and no tenderness upon palpation. The most reliable means of detecting minimal tenderness is percussion with the fist posterior to the kidney, but even this may not be successful.

Step 4, Examination of the External Genitalia: Here lie many pitfalls for the inexperienced ob-

TABLE 1.—*The Routine Non-Instrumental Steps of a Urologic Examination.*

1. *History:* (a) Urinary, (b) Sexual, (c) Other systems.

2. *General physical examination apart from urogenital tract:* Temperature, pulse, respiration, blood pressure. (a) Head, (b) Neck, (c) Chest, (d) Nervous system.

3. *Abdominal Examination:* Particular care in examining the regions occupied by kidneys, ureters and bladder, including fist percussion of the renal areas posteriorly.

4. *Examination of external genitalia: Making a urethral smear when a discharge is present.* This step is carried out prior to collecting the urine because it is impossible to be certain of the presence of a urethral discharge or to obtain a smear after the patient has voided.

5. *Examination of the urine:* Male, three-glass test; female, catheterized specimen. Three-glass test roughly differentiates lower from upper tract disease in the male. Microscopic elements found in the voided urine may come from extraneous sources in the female.
   (a) Specific gravity   (d) pH
   (b) Protein   (e) Microscopic examination
   (c) Sugar   (f) Stain of urinary sediment.

6. *Rectal examination and prostatic smear in the male; vaginal and rectal examination in the female:* In the male the patient voids prior to examination of the prostate; otherwise the prostatic secretion will contain pus from the urethra if urethritis is present, rendering it impossible to localize its source.
   (a) Examination of anus and sphincter
   (b) Palpation of prostate and seminal vesicles
   (c) Gentle massage of prostate and stripping of seminal vesicles unless contraindicated, as in the presence of acute infection.
   In the female the urine is withdrawn with a catheter prior to pelvic examination in order that this examination may be made with bladder empty.

7. *Total renal function:*
   (a) Tests of excretion (PSP)
   (b) Tests of retention (blood urea, nonprotein nitrogen, creatinine).

8. *Roentgenography (as indicated):* Plain x-ray of kidneys, ureters and bladder, intravenous urograms, x-rays for evidence of metastasis.

server. The physician should ascertain whether there is or has been a urethral discharge. This must be done before examination of the urine (Step 5), because if the patient urinates just before examination of the external genitalia any urethral discharge will be washed out by the urine.

Dependence must not be placed upon a patient's statement that he has had no discharge. In females, vaginal secretions are so common that many consider them natural; males may be either oblivious to a discharge or ashamed to admit its presence. In examining for a urethral discharge it is advisable to strip the urethra. This one simple maneuver will often provide the clue to the source of obscure pyuria. In the female, pressure over the urethra may disclose an unsuspected diverticulum when a gush of pus is expressed into the external urethral orifice.

Two misconceptions to be avoided concern the significance and character of a urethral discharge: First, that every urethral discharge is gonococcal, and second, that a precise diagnosis can be made by gross inspection of the discharge—that the infection is gonococcal if the discharge is thick and creamy but nonspecific if it is thin and watery. In many cases of acute nonspecific urethritis the discharge is purulent, while a gonococcal discharge may be detectable only as a thin serous ooze, sometimes characteristic in repeated attacks.

In order to make an accurate distinction, a stained smear of the discharge must be prepared and the organisms present identified under a microscope. This simple procedure can be carried out by a physician in only a few minutes (Table 2). The advantage to a physician in making the smear himself is that he can determine at once whether and what treatment is required; also how many organisms and pus cells are present and whether the diagnosis is clearly evident or merely suspicious—information sometimes difficult to obtain second-hand.

In examination of the external genitalia it must be ascertained whether the external urethral orifice is of normal size. Unrecognized congenital atresia of the orifice may lead to severe obstruction and even to bilateral hydronephrosis and profound uremia (Figure 1).

Lest an obscure testicular neoplasm be overlooked meticulous care must be taken in palpating the testis. A testicular tumor may be little larger than the eraser on a lead pencil. Since the majority of tumors of the testis are malignant, it is extremely important to detect them as early as possible. Tumors of the epididymis, on the other hand, are extremely rare and almost always benign.

A fairly common error is failure to recognize torsion of the spermatic cord, a condition which demands immediate operation. Torsion is frequently misdiagnosed as acute epididymitis, and before the error is recognized the testicle is beyond salvage. Although the two conditions are similar in that they are both exquisitely painful, certain features differentiate them; but if there is any doubt, the safer course is surgical exploration of the scrotum.

TABLE 2.—*Simple Methods for Useful Office Procedures*

1. *Examination of the urine:*
   (a) *The three-glass test in the male:* Instruct patient to void without interruption into three glasses. First glass contains washings from urethra; second and third, urine from bladder; third glass may contain pus or blood introduced by piston-stroke action of vesical neck closure, as in acute posterior urethritis.
   (b) *Determination of the pH:* Nitrazene paper.
   (c) *Protein tests (albumin):* Add a few drops of sulfosalicylic acid (20 per cent).
   (d) *Sugar:* Add a Clini-test tablet.
   (e) *Examination of sediment:*
       1. Centrifuge adequately.
       2. Invert centrifuge tube to allow all but a few drops to drain out.
       3. Make thin smear of sediment on clean slide; examine under microscope (low and high dry fields).
       4. Dry over low flame to fix (do not burn.)
       5. Stain.
           a. Loeffler's methylene blue—most rapid stain for common pyogenic bacteria, excellent for showing morphologic features—best general purpose office stain.
           b. Gram stain—best for identification of gonococci.
       6. Examine under oil immersion lens.
   (f) *Determining cause of cloudy urine:*
       1. Phosphates—clear on acidification (add few drops glacial acetic acid).
       2. Carbonates—clear on acidification, with formation of bubbles.
       3. Urates—white or pink cloud (brick dust deposit), clear on heating.
       4. Chyluria—clears upon shaking with ether.
       5. Pus—determined by microscopic examination, does not clear on acidification or heating
       6. Bacteria—determined by microscopic examination, do not clear on acidification or heating.
       7. Red blood cells—determined by microscopic examination, do not clear on acidification or heating.
       8. Spermatozoa—determined by microscopic examination, do not clear on acidification or heating.
       9. Prostatic fluid—determined by microscopic examination, does not clear on acidification or heating.

2. *Urethral Smear:*
   Examine wet for trichomonas (add 1 per cent safranine for better identification). Heat over low flame to dry and fix—do not burn. Stain with methylene blue or Gram stain. Examine with oil immersion lens.

3. *Prostatic Smear:*
   Collect specimen, after massage, on clean glass slide; occasionally stripping of urethra or having patient void a few drops of urine is necessary to obtain secretion. Examine under low power, noting presence of pus (leukocytes numbering less than 5 per cent of all cellular elements are of no clinical significance), trichomonas, lecithin bodies, corpora amylacea, etc. Stain to determine presence of bacteria.

4. *Tests of renal function:*
   (a) *Specific gravity of urine:*
       A specific gravity of 1.025 or higher, if no protein is present, indicates normal renal function.
   (b) *PSP* (simple modification as office procedure):
       1. Have patient drink 2 glasses of water.
       2. Inject 1 ml. of dye intravenously.
       3. Collect urine 20 minutes after injection.
       4. Place entire specimen in 1,000 ml. graduate, add a few ml. of 10 per cent sodium hydroxide to color red and dilute to 1,000 ml. with tap water.
       5. Determine percentage of PSP excretion with colorimeter—normally 25 to 50 per cent is excreted in 15 minutes. In this 20-minute test 5 minutes is allowed for appearance time.
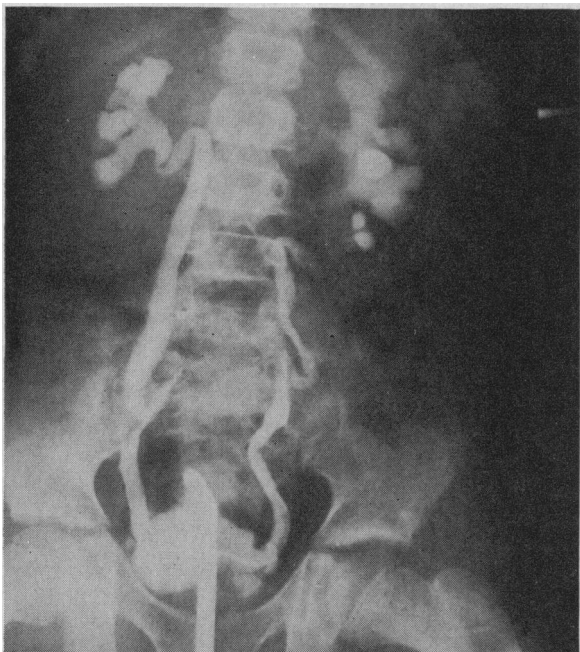
Figure 1.—Bilateral hydronephrosis and hydroureter in a boy 11 years of age with profound uremia from congenital atresia of external urethral orifice. Note trabeculation of the bladder. (Courtesy of Dr. George L. Torassa.)

Step 5, Examination of the Urine, likewise presents many pitfalls to the unwary. One of the commonest is to conclude that a female patient has pyuria or hematuria merely because the voided specimen contains pus or erythrocytes. The presence of pus cells, erythrocytes or bacteria in the voided urine of a female patient may be of no clinical significance, yet many a patient is referred to a urologist on the basis of these findings alone. The proximity of the urethra to the vagina frequently permits contamination of the urine with the products of vaginal discharge and menstrual flow. Mistake as to the source of contamination may be avoided by taking a specimen of urine by catheter whenever abnormal elements are found. In urologic practice female patients are catheterized routinely to save time, for if, after voided urine is found to contain pus or blood, a catheter is introduced to obtain a proper specimen, there is usually no urine left in the bladder.

Simple examinations of the urine can be conveniently performed by a physician (Table 2). If the urine is sent to a laboratory there is always the chance that examination may be delayed and that, if it is, erythrocytes may disintegrate in acid urine and extraneous bacteria may be introduced and multiply. Furthermore, here as with examination of the urethral discharge, immediate examination provides a guide for immediate treatment.

By the simple means of the three-glass test of the urine of a male patient it is possible roughly to distinguish disease of the lower urinary tract from disease of the upper tract. For instance, if pus cells are contained in only the first glass of the voided urine, it is certain that infection is confined to the lower urinary tract and that there is no infection of the kidneys—unless there is blockage of a ureter. Another way in which the three-glass test may prove valuable is in localizing the source of hematuria in male patients. If, for example, the blood is equally distributed in all the urine voided, it probably comes from the bladder or the upper urinary tract. If, on the other hand, the first and second glasses are relatively clear and there is a great deal of blood in the third glass, it is practically certain that the lesion is at the neck of the bladder and that the blood is forced into the urine by the piston-stroke action of vesical closure.

Gross examination of the urine is inadequate, but often nothing more is attempted. If a specimen appears to contain blood, for example, there is a strong temptation not to bother to examine it under a microscope. Yet if this is not done, hemoglobinuria cannot be recognized, nor can it be known whether the blood is accompanied by pus cells and bacteria indicating that bleeding may be caused by infection in the urinary tract.

Often a person seeks medical advice because of cloudy urine. Cloudiness of the urine does not mean that it contains pus, yet the misconception that it does is common among patients, if not among physicians. Whether it does or does not can be determined readily by examining the sediment under the microscope. Likewise, foul smelling urine is not always indicative of disease; frequently fetor results from the ingestion of asparagus or from some other benign cause.

An error that causes failure to recognize chronic pyelonephritis is the belief that if there are no pus cells in the urine there is no urinary infection. In many cases of chronic nonspecific pyelonephritis, the urine contains bacteria but no pus cells or erythrocytes. For this reason it is necessary to examine not only a wet smear of the urinary sediment, but also a stained specimen. Usually, motile bacilli can be seen in the wet preparation, but it is impossible to detect cocci without a stain. Other conditions in which bacteria often are present in the urine without pus or erythrocytes are perinephritis, perinephric abscess and the early stages of coccal nephritis.

If pus cells are present in the urine, and bacteria are not, usually the source is nonspecific prostatitis or urethritis. The reason for the absence of observable bacteria in most such cases is not always clear. Some infections are caused by organisms like those of pleuropneumonia, which are detectable only by special cultural methods. To be considered also is that, if a patient has been receiving antibiotics, bacteria frequently have been eliminated by the action of the drug. In other instances, an apparently amicrobic infection may be tuberculous; tubercle bacilli are difficult to detect in the urine by ordinary means of examination.

Another common misconception is that if the urine is normal there is no lesion of the urinary tract. This leads to error in the case of female patients with frequency of urination, dysuria, suprapubic pain and nocturia. Often if the urine contains no pus or

erythrocytes or organisms, the underlying condition is thought to be functional, although these symptoms of vesical irritability may be caused, without any abnormality in the urine, by any of five conditions: (1) submucous fibrosis, (2) trigonitis, (3) contracture of the vesical neck, (4) neurogenic disorder of the bladder, and (5) stricture of the urethra. Cystourethroscopic examination is necessary.

Step 6, Rectal Examination and Examination of Prostatic Secretion. Perhaps the most important word of caution is to urge that rectal examination never be omitted. Even after Osler's sage advice that nine-tenths of all rectal lesions lie within one finger's-length of the anus, some physicians omit this essential step or, if they do make the examination, fail to interpret the findings accurately.

Dr. Egon Wildbolz of Berne, Switzerland, once spoke in San Francisco on the early diagnosis of carcinoma of the prostate. When he had completed his talk a medical student asked, "Doctor, can you tell me just how one makes the diagnosis of carcinoma of the prostate by rectal examination?" Al-though Dr. Wildbolz had devoted at least thirty minutes to discussion of that procedure, he did not hesitate to reply. "Yes," he said, "I can tell you. If you perform 2,000 rectal examinations you will have absolutely no difficulty in making early diagnosis of carcinoma of the prostate."

It is an inviolate rule that prostatic massage must never be performed if there is acute infection in the urethra or in any part of the seminal tract, because of the danger of increasing and spreading the infection. In all other cases, examination and massage of the prostate gland must follow, not precede, collection of the urine—this in order that the cellular elements of the urine and the prostatic secretion will not be mixed. It is probably reversal of the order of these procedures which gives rise to the misconception that chronic prostatitis is a common disease. If a patient has mild urethritis, which is a common disease, massage of the prostate gland presses the secretion through the purulent urethra. Consequently, the pus in the secretion is erroneously thought to be due to prostatic infection. If the patient urinates before the prostatic secretion is ex-
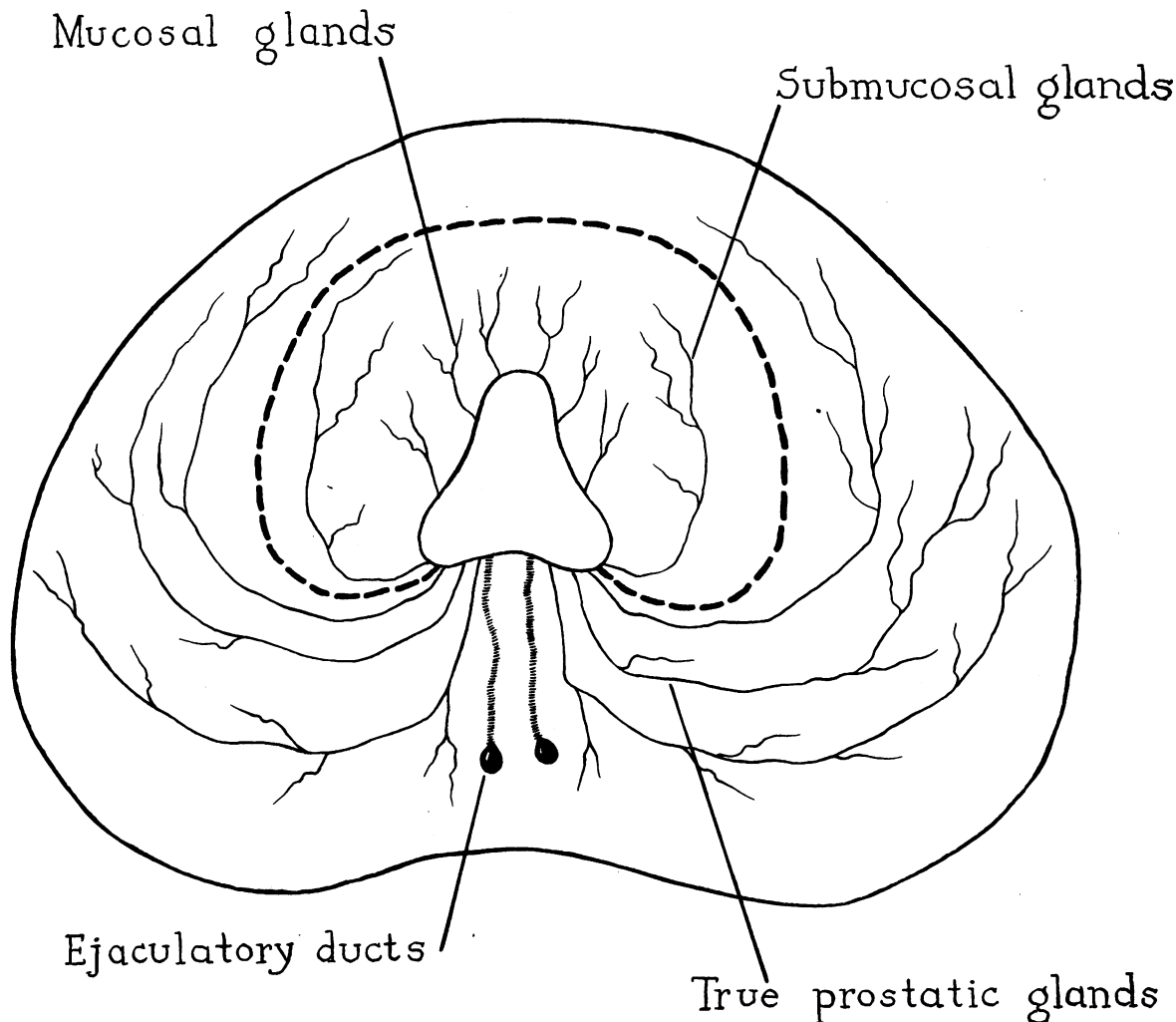

Figure 2.—Cross-section of arrangement of prostatic glands. Pressure must be applied from a lateral direction medially in order to express secretion.
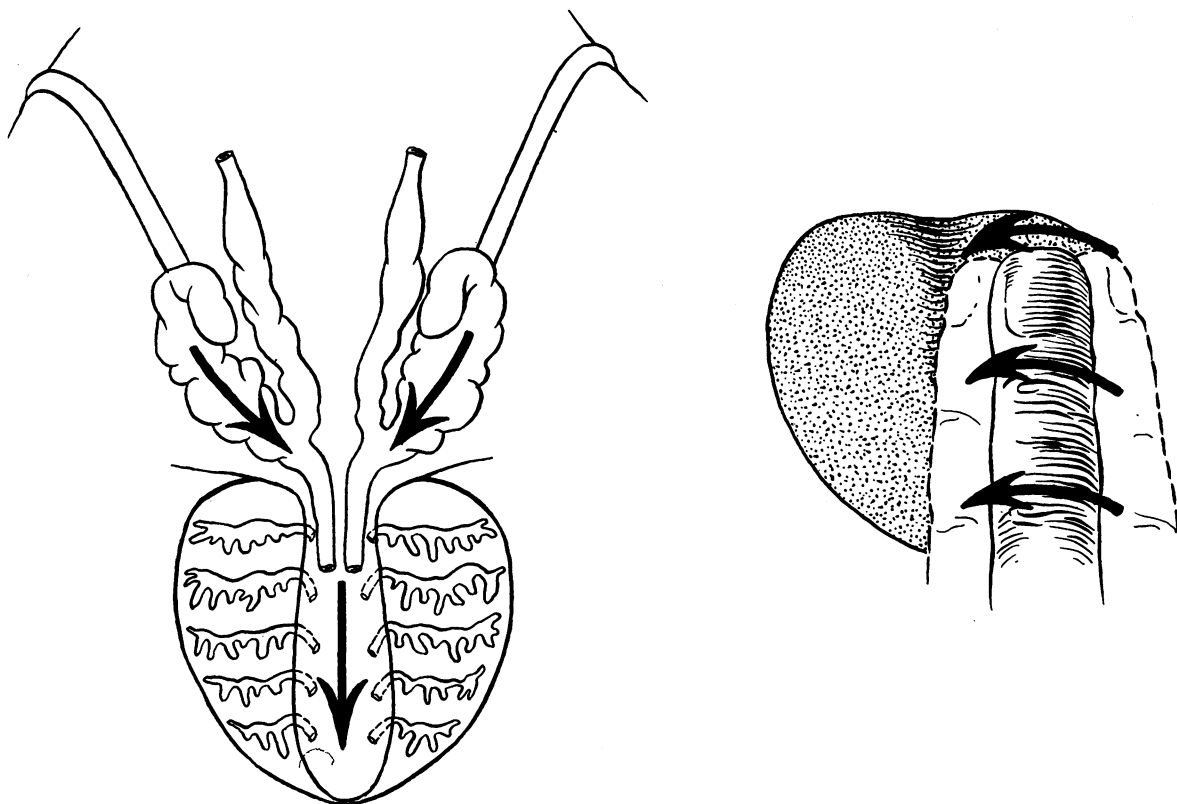
Figure 3.—Method of prostatic massage. Firm but gentle pressure is applied with a rolling motion of flat surface of index finger. Final step is gentle stripping of seminal vesicles and evacuation of prostatic urethra.

pressed, this error is avoided. The presence of a few pus cells in seminal fluid (less than 5 per cent of the cellular elements) that is obtained after the patient has urinated is not indicative of prostatitis.

Massage of the prostate gland is not an innocuous diagnostic procedure. It should be carried out with extreme gentleness and at infrequent intervals; done vigorously and repeatedly, it may cause traumatic prostatitis. It is not necessary to massage the prostate gland three times within a week to make certain that prostatitis is not present. If the gland seems normal on palpation and if the secretion is normal, these observations should be considered sufficient evidence that there is no infection.

O'Connor[1] in experiments with dogs noted that repeated prostatic massage evokes traumatic prostatitis. In a controlled series of animals, the degree of prostatitis noted at necropsy was directly proportional to the number of massages the animals received: After the prostate had been massaged daily for seven days, there were extensive abscesses and diffuse parenchymal prostatitis. Dogs that had had fewer prostatic massages had proportionately less prostatic involvement. In those dogs in which the prostate had not been massaged, it was normal.

Parallel observations were plentiful in the author's early clinical experience when frequent prostatic massage was more commonly resorted to. Vigorous massage often evoked a violent inflammatory reaction in a normal prostate gland or in one with minimal chronic prostatitis. It is the author's present opinion that treatment of even mild, asymptomatic chronic prostatitis by vigorous or frequent massage is of no benefit, and that patients with such a condition do better with no treatment at all. The fear of focal infection from prostatitis seems to have been exaggerated and the hazard not as serious as it was formerly believed to be. The fact that patients without urogenital complaints are no longer so often referred to urologists in an effort to find foci of infection is indicative that others in the medical profession are coming to share this opinion.

With regard to the rectal examination, it should not be concluded, merely because the prostate seems normal on rectal palpation, that the possibility of an obstruction of the vesical neck has been ruled out. Although the rectal surface may be normal, the vesical neck may be severely obstructed by a median lobe or a median bar or by intravesical projection of the lateral prostatic lobes.

Another pitfall lies in making the erroneous diagnosis of prostatitis on the sole basis of tenderness on rectal palpation. In many cases the normal prostate is tender—so tender, as a matter of fact, that palpation may cause patients with no disease of the prostate to lose consciousness. (It is mystifying that, as a general rule, patients experience more pain during rectal examination than during passage of a urethral catheter.)

A knowledge of the glandular structure of the prostate enables the physician to perform prostatic massage intelligently. Since the ducts drain toward

the urethra (Figure 2) it is important to apply pressure from the side medially. The prostate should not be rubbed. By applying firm but gentle pressure with a rolling motion of the flat surface of the index finger (Figure 3), secretion is obtained without damage to the delicate glandular structure of the organ. As a final step, secretion is evacuated gently by stripping the seminal vesicles and the urethra. The reason so many physicians fail to obtain secretion on prostatic massage is that they do not observe these few simple rules.

The counterpart of the rectal examination of males is the combined rectal and vaginal examination of women. Here a point to remember is that this step must follow, not precede, catheterization of the bladder, for urine retained in the bladder may be mistaken for a pelvic mass, an error which has even led to unnecessary pelvic operations.

Step 7, Tests of Total Renal Function, is not necessary if the diagnosis has been established by the previous steps, as for example in cases of uncomplicated urethritis or hydrocele of the tunica vaginalis. If, on the other hand, the symptoms or the previous investigation indicate the possibility of abnormality of the kidneys or ureters, the carrying out of this and the following step is imperative. Study of the upper urinary tract is likewise required if a lesion in the lower urogenital tract involves or affects the upper urinary tract.

There are two groups of tests from which to choose: (1) the tests of retention and (2) of excretion. An accurately performed test from either of these groups is sufficient, but tests from one group may be used to confirm those from the other.

All tests of urinary retention—determination of blood urea, non-protein nitrogen and creatinine—are innocuous. Disadvantages are that they are not office procedures and that obtaining a report is delayed.

Fortunately, two innocuous tests of excretion are simple office procedures and can be carried out within a few moments by a physician or a nurse: (1) Determination of the specific gravity of the urine. If the specific gravity is 1.025 or above and there are no abnormal cellular elements, renal function is normal. (2) The phenolsulfonphthalein (PSP) test. This is especially useful in a busy office practice when three or four new patients all come in at the same time. A nurse can inject 1 ml. of PSP intravenously, or even intramuscularly, and the patient will be content to wait while the test is in progress, knowing time is not being lost until the physician can see him. Collection of urine can be made at intervals of from 20 minutes up to two hours, allowance being made for the time of collection. The PSP test can also be used as an isolated test or a confirmatory test to check renal function of patients whose urine has a low specific gravity or contains cellular elements. Excretion of 25 per cent or more of the dye within 20 minutes after intravenous injection is a rough indication of normal function. If no more than 15 per cent has been excreted within that time, function is probably adequate to permit

excretion of the contrast medium for intravenous urography, but if the percentage drops below this, the risk is too great. To conclude the PSP test a urethral catheter is passed to determine the amount of residual urine. This assures that all the urine has been collected for the PSP reading—as it must be for an accurate determination.

Intravenous urography is another excretory test of renal function, but it is not without hazard, as will be explained. With the use of this method, a roentgenogram made after the patient urinates provides a check on the amount of residual urine.

It should be pointed out that none of the tests of renal function gives indication of renal reserve. When the readings are normal there is no way of distinguishing between patients with a large renal reserve and those who may be on the borderline of renal failure.

Step 8, Roentgenography: Like the tests of renal function, this step may be unnecessary if a conclusive diagnosis has been previously established. If roentgenography is decided upon, the tests of renal function are a prerequisite. The radiologist tests the patient for sensitivity to the contrast medium, but it is the responsibility of the physician ordering the study to be certain that the patient has adequate renal function. If the renal function is severely impaired, not only are intravenous urograms a wasted expense to the patient (because the kidney shadows do not appear on them), but there is a very real danger in injecting a contrast medium that will not be promptly excreted. The author has observed one fatality that resulted from this error: The patient, a young man, died of pulmonary edema caused by the retained medium. Evidence of acute glomerulonephritis was found at autopsy. In that case urography had been precipitously ordered when hematuria was observed; no prior examination of the urine or test of renal function was made, although these steps would have established the correct diagnosis and revealed the danger of intravenous urography.

A few cautions should be kept in mind regarding the interpretation of intravenous urograms:

1. The fact that a kidney is not visible during the intravenous study is not certain evidence that the kidney is absent or functionless. It is a danger signal that demands prompt interpretation, usually by cystoscopy, in the hope of salvaging a functioning kidney that is being destroyed by a block of some kind.

2. A normal calyceal and pelvic outline is no indication that the kidney is normal unless the outline is surrounded by a wide rim of renal parenchyma (Figure 4). An infantile or an atrophic kidney may be deceptive in excreting the contrast medium promptly and producing a pelvic shadow which on superficial examination appears normal. In interpretation of a urogram, as much stress must be placed on the appearance of the entire kidney as upon the internal anatomy of pelvic structures.

3. A grossly normal appearance on an intravenous urogram cannot be assumed to rule out the possibility of early renal tumor. Excretion urography cannot be relied on for the detection of

early filling defects and minute lesions of the renal pelvis. Retrograde pyelograms, supplemented by lateral views, provide shadows that are far better defined. By this means more adequate filling and a better concentration of the contrast medium is obtained.

Three additional generalizations, while not directly concerned with diagnosis, and not to be considered inviolable laws, may prove helpful:

1. Hemospermia does not usually bear the same serious implication as blood coming from other organs of the body. It usually originates from prostatitis, seminal vesiculitis or early benign prostatic hypertrophy, not usually from carcinoma of the prostate.

2. Contrary to common belief, hematuria occurs more frequently in cases of benign hypertrophy than in cases of carcinoma of the prostate. The reason is obvious: Benign hypertrophy originates in the periurethral glands, carcinoma in the periphery of the prostate.

3. Patients are always more alarmed about hematuria associated with pain than they are about painless hematuria although the latter is decidedly more ominous. Painful hematuria usually indicates urinary infection or calculous disease, whereas painless hematuria more regularly signifies tumors.

Although careful execution of the non-instrumental steps outlined above suffices for the diagnosis of most urological conditions, it is just as important to understand their limitations as to know how to execute them, for in some instances additional studies are required. The overwhelming indication for instrumental examination is lack of a clear-cut diagnosis after non-instrumental study. The specific indications may be summarized by stating a few general principles:

Cystourethroscopy is indicated (1) to determine the cause of residual urine, (2) to identify the cause of unexplained urinary complaints.

Study of the upper tract is indicated (1) to determine the cause of unexplained failure of function of one or both kidneys reflected in the results of the total renal function tests or intravenous urograms, (2) to elucidate any obscure findings noted on intravenous urography, or to supplement intravenous urograms when no gross abnormality is noted but renal tumor is suspected.

A complete urological investigation, which includes cystourethroscopy, supplemented by ureteral catheterization when indicated, should be performed whenever the cause of hematuria, pyuria or bacteruria is not explained by non-instrumental study.

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REFERENCE

1. O'Connor, Vincent J.: Critical analysis of therapeutic measures in the management of pyogenic prostatitis, J. Urol., 39:156-161, Feb. 1938.
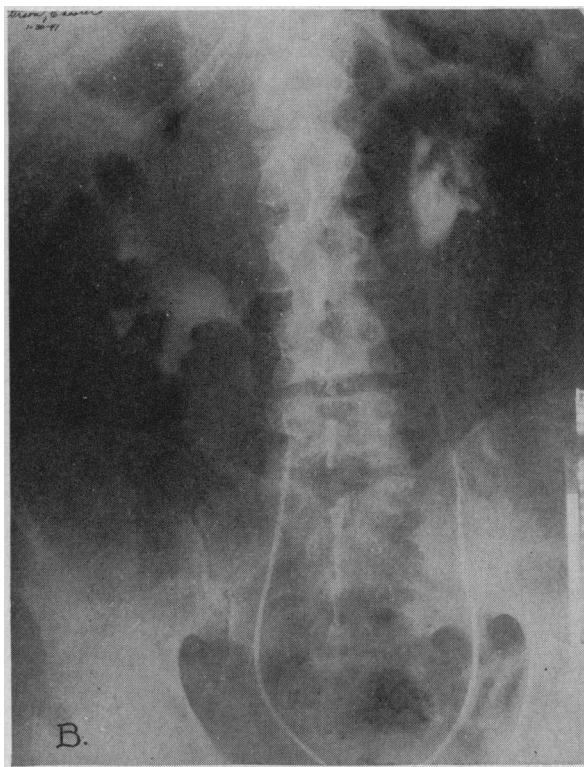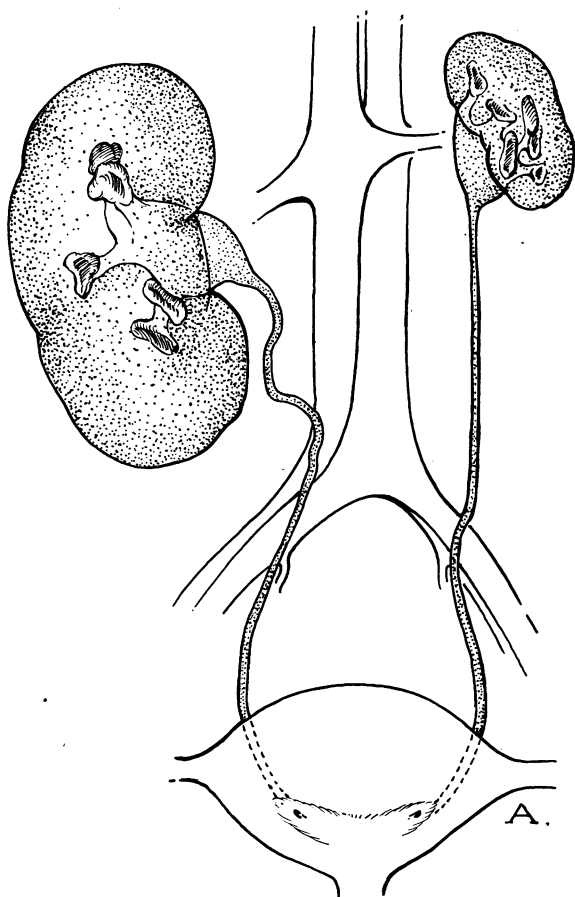

Figure 4.—Congenital hypoplasia of left kidney. Note narrow rim of secretory tissue insufficient to support life. Although superficial study of pyelogram (B) might suggest a normal left kidney, error in diagnosis is avoided by noting: (1) Narrow rim of parenchyma on left, (2) large size of right kidney due to compensatory hypertrophy, (3) infantile type of left renal pelvis.